Space Weather Forecast

Issued on Wednesday, 31 January 2024 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated R1/R2 Radio Blackouts. Possible glance from CME and slight chance of peak G1/Minor Storm conditions Day 1 (31 Jan).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low, with the largest flare a mid common-class event peaking at 30/1739 UTC from a region now beyond the northwestern limb. There are currently eight sunspot regions on the disc, the largest of which is located in the northeast disc. This region has seen a steady increase in overall size and maintains a moderately complex magnetic configuration. Another region in the northeast is small, but it comprises a north-south magnetic alignment in its leading portion, inferring some instability that could result in notable flaring. Other spots on the disc have generally shown some slow development, but remain fairly simple and stable at this time. A new, large region just rotating over the southeast limb may reveal more complexity at it rotates into clearer view.

No Earth-directed coronal mass ejections (CME) were evident in coronagraph imagery.

Solar Wind / Geomagnetic Activity: Solar winds were indicative a minor enhancement from a coronal hole with the winds decreasing from between slightly elevated to elevated levels, to become more persistently slightly elevated. The interplanetary magnetic field (IMF) was weak throughout, with the important north-south component also varying weakly. The net result of the above solar wind measures was Quiet geomagnetic activity (Kp 0-2).

Energetic Particles / Solar Radiation: High energy proton flux is at slightly elevated levels, but remains below the S1/Minor Storm threshold. There is a nominal risk of exceeding the S1 threshold during the period, with a slightly greater chance of this occurring on day 1 (31 Jan).

Four-Day Space Weather Forecast Summary

Solar Activity: Low, but with a chance of increasing to Moderate with isolated Moderate-class flares, most likely from the two largest regions in the northeast disc.

Solar Wind / Geomagnetic Activity: One potential CME arrival features in the period, with a glancing blow possible later on Day 1 (31 Jan). Ongoing minor coronal hole influence is expected to wane in the coming days with speeds expected to ease to background levels. The next coronal hole enhancement is likely from Day 3 (02 Feb) onwards, with speeds increasing to slightly elevated and perhaps elevated levels at peak. Generally Quiet to Unsettled geomagnetic conditions are expected, with a chance of peak Active intervals and a slight chance of G1 Minor Storm conditions later on Day 1 (31 Jan). There is a further chance of isolated Active intervals on Days 3 and 4 (02 and 03 Feb) in association with the next coronal hole influence.

Energetic Particles / Solar Radiation: High energy proton flux is expected to remain below the S1/Minor Radiation Storm level, with a nominal risk of exceeding the S1 threshold during the period. There is a slightly greater chance of this occurring on day 1 (31 Jan).

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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